

**REMARKS**

The Office Action mailed on May 24, 2004, has been reviewed and the comments of the Patent and Trademark Office have been considered. Prior to this paper, claims 1-11, 12-14, 16-17, and 24-27 were pending, with claims 6-8, 10, 11 and 13-18 being provisionally withdrawn from consideration. By this paper, Applicants add claims 28-34, and do not cancel any claims. Therefore, claims 1-11, 12-14, 16-17, and 24-34 are now pending.

Applicants respectfully submit that the present application is in condition for allowance for the reasons that follow.

**An In-Person Interview is Requested**

Applicants respectfully request an in-person interview with Examiner Keith prior to the mailing of any future office action other than a Notice of Allowance. In this regard, Applicants' representative will contact Examiner Keith during the week of November 29, 2004. Further, Applicants' submit along with this paper an Interview Request Form.

**Forward**

I. Much has been made in the previous two Office Actions regarding whether TiO<sub>2</sub> always possesses superhigh hydrophilic properties, and Applicants' assertions in the Specification of the application and in the prior Responses. For example, the Office Action, at page 3, first full paragraph, contains the statement that Applicants appear to be contradicting themselves: "That is on the one hand TiO<sub>2</sub> only possesses the superhydrophilic property, but on the other hand it does not."

Applicants submit that the previous assertions regarding the superhigh hydrophilic properties of TiO<sub>2</sub> are analogous to an assertion regarding whether concrete has significant tensile strength properties. Concrete, while having significant compression strength properties, typically has negligible tensile strength properties. That is, under tension, concrete

will typically separate. In contrast, *pre-stressed* concrete has significant compression and tension strength properties. Thus, two pieces of concrete, “chemically” identical to each other, exhibit drastically different properties.

In an analogous fashion,  $TiO_2$  alone can possess superhigh hydrophilic properties when it is used a certain way, while other times  $TiO_2$  alone does not possess superhigh hydrophilic properties. For example, the flatness of the carrier on which the  $TiO_2$  is disposed or the microstructure of the  $TiO_2$  surface may be determinative as to whether  $TiO_2$  alone possess superhigh hydrophilic properties. Thus,  $TiO_2$  alone does not *always* possess superhigh hydrophilic properties. Therefore, it is entirely consistent to take the position (1) that simply because a reference teaches  $TiO_2$ , (2) that reference does not necessarily teach a substance with a superhigh hydrophilic property, as is taken in the prior Responses, and (3) that “ $TiO_2$  has an ion exchange ability and/or a superhigh hydrophilic property” and it “is generally known that  $TiO_2$  shows a superhigh hydrophilic property when it is used in combination with an  $SiO_2$  binder.”

**II.** It is almost certain that Skarpelos does not utilize  $TiO_2$  as a superhigh hydrophilic substance. As noted in the Office Action, Skarpelos teaches that a device is coated with  $TiO_2$  and/or  $ZrO_2$ . That is, Skarpelos teaches that  $ZrO_2$  is a substitute for  $TiO_2$  as a coating. Since  $ZrO_2$  does not exhibit superhigh hydrophilic properties, it is unlikely that the  $TiO_2$  as a coating in Skarpelos exhibits such properties. If Skarpelos meant to use  $TiO_2$  as a superhigh hydrophilic substance, he would not have taught use of a non-superhigh hydrophilic substance such as  $ZrO_2$  as an alternative.

**III.** The Office Action again cites *In re Pearson*, *In re Yanush*, *In re Finsterwalder*, *In re Casey*, *In re Otto*, and *Ex parte Masham* in asserting, again, that it is not necessary to give patentable weight to claim elements associated with the phrase “adapted to.” In the Response of February 2004, Applicants detailed the errors in relying on these six cases to support the position taken in the Office Action vis-à-vis “adapted to.” However, the latest Office Action does not address Applicants’ arguments in regard to these cases. Applicants respectfully request that Applicants’ arguments be considered and explicitly addressed for each case, *or patentable weight be given to the elements associated with “adapted to.”*

**Rejections Under 35 U.S.C. § 112, First Paragraph**

Claims 1-5, 9 and 24-27 again stand rejected under 35 U.S.C. §112, first paragraph, as lacking enablement. Applicants again respectfully disagree and submit that one of skill in the art would be able to practice the inventions as claimed.

Applicants do not argue that “TiO<sub>2</sub> alone is not a superhigh hydrophilic substance,” as is asserted on page 4 of the Office Action. TiO<sub>2</sub>, when used a certain way, exhibits superhigh hydrophilic properties. By way of example and not by way of limitation, a corrugated plate properly coated with TiO<sub>2</sub> alone may exhibit superhigh hydrophilic properties, as would readily be understood by one of ordinary skill in the art. Applicants disclosed the use of TiO<sub>2</sub> as a substance to obtain a superhigh hydrophilic property. Applicants also disclosed the use of a coated corrugated plate used to trap liquid drops that fall on the plate. Applicants respectfully submit that as long as the specification recited the use of TiO<sub>2</sub> having a superhigh hydrophilic property at the time of filing, the skilled artisan was enabled to practice the above rejected claims, even without an exact specific recitation of the factors that provide TiO<sub>2</sub> with a superhigh hydrophilic property.

Claims 1-5, 9 and 24-27 also stand rejected under 35 U.S.C. §112, first paragraph, based on the allegation that the best mode has not been disclosed.

In response, Applicants traverse the rejection, and rely on the fact that TiO<sub>2</sub> alone may be a superhigh hydrophilic substance, when properly used, and that the artisan of ordinary skill would know how to utilize TiO<sub>2</sub> alone to obtain a superhigh hydrophilic substance to practice the pending claims.

Further, best mode is a subjective standard based on the mode contemplated as being such *at the time of filing of the application*, and there is a presumption that the best mode, *as contemplated at the time of filing*, is disclosed in a patent application. Assuming *arguendo* that the facts supporting the allegations in the Office Action are correct, no arguments sufficient to rebut this presumption have been proffered to date.

In sum, there are currently no grounds to reject the claims for the above identified reasons, and the rejection should be withdrawn.

**Rejections Under 35 U.S.C. § 112, Second Paragraph**

Claims 1-5, 9 and 24-27 stand rejected under 35 U.S.C. §112, second paragraph, as failing to set forth the subject matter which Applicants regard as their invention. Specifically, the Office Action relies on statements made by Applicants on July 17, 2003, and February 25, 2004, that “applicant has stated it is not known if TiO<sub>2</sub> alone is a Superhydrophilic substance, nor is a binder material critical to the invention. Thus, these statements indicate that the invention is different from what is defined in the claims.”

In response, Applicants traverse the rejection. First, Applicants have not made the above identified statements. Applicants have only argued that a reference containing a mere teaching of TiO<sub>2</sub> alone *is not enough* to present an anticipatory reference vis-à-vis the claims, *because the requirements for anticipation are strict*, and TiO<sub>2</sub> alone may or may not be a superhigh hydrophilic substance. If the PTO continues to allege such statements were made, Applicants request that the PTO identify the page and line numbers where such statements are found, that the statements be reproduced exactly as made in any next Office Action, and a detailed explanation of why such statements are characterized by the PTO in the manner proffered in the Office Action, in view of the requirements for a reference to anticipate a claim.

Second, Applicants submit that even if the above were true, the PTO has not carried its burden in proving that such statements are sufficient to render the *rejected* claims indefinite. It is not enough to reiterate past statements made by Applicants and then state a conclusion as to indefiniteness of the claims. A more thorough explanation, sounding in “cause-and-effect” analysis, is required. Applicants therefore respectfully request that the rejection be withdrawn.

Claims 1-5, 9 and 24-27 also stand rejected under 35 U.S.C. §112, second paragraph, as being incomplete for omitting essential elements. Specifically, the Office Action states that “the omitted elements are critical or essential materials required for the Superhydrophilic substance to function as set forth by applicant *to define over the identical structure of Skarpelos.*” (Emphasis added.)

In response, Applicants submit that an incorrect standard is being applied to the claims to substantiate this rejection, as will be understood when addressing the lack of

anticipation by Skarpelos below. Briefly, Skarpelos is not an anticipatory reference at least because it does not contain a teaching of a use of TiO<sub>2</sub> as a superhigh hydrophilic substance. Therefore, there is no need to positively claim any additional feature that shows why the claims are not anticipated by Skarpelos and thus different from Skarpelos. TiO<sub>2</sub> may or may not be a superhigh hydrophilic substance, and so the mere recitation of TiO<sub>2</sub> in Skarpelos does not mean that Skarpelos anticipates the claims. This is because Skarpelos *does not explicitly or inherently disclose each feature of the claims*. Thus, the structure of Skarpelos is not identical to the invention of claim 1, because it has not been shown to function in a manner that anticipates the claims, and there is no need to add additional recitations to the claims to provide a feature different from Skarpelos. A continued requirement to add additional recitations to overcome the present rejection of the claims amounts to a requirement that Applicants amend a claim to address a deficiency in a reference used to reject claims as anticipated by the PTO. Such a requirement simply does not exist. Withdrawal of the rejection is requested.

### **Rejections Under 35 U.S.C. § 102**

Claims 1-5 and 24-27 stand rejected under 35 U.S.C. §102(b) as being anticipated by Skarpelos (USP 5,028,384). In response, Applicants respectfully submit that claims 1-5 and 23-25 are allowable for the reasons that follow.

Applicants rely on MPEP § 2131, entitled “Anticipation – Application of 35 U.S.C. 102(a), (b), and (e),” which states that a “claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference.” (Emphasis added.) It is respectfully submitted that Skarpelos does not describe each and every element of the rejected claims.

In rejecting the claims, the Office Action asserts that “Skarpelos discloses a structure *inherently* capable of meeting applicant’s claimed inventive concept.” (Emphasis added.) It appears that the rejection relies on the fact that Skarpelos discloses a component coated with TiO<sub>2</sub>, and the allegation that “TiO<sub>2</sub>, as set forth by applicant . . . is a known Superhydrophilic substance.”

As noted above, the specification does not state that TiO<sub>2</sub> is always a superhigh hydrophilic substance. TiO<sub>2</sub> may or may not be a superhigh hydrophilic substance, depending on how it is used, and the skilled artisan would have known this when the application was filed. In the case of Skarpelos, TiO<sub>2</sub> is not used as a superhigh hydrophilic substance, and no evidence other than the repeated incorrect assertion that Applicants' specification teaches that it is always a superhigh hydrophilic substance is proffered to demonstrate otherwise.

\* \* \* \* \*

**It is again repeated that it is almost certain that Skarpelos does not utilize TiO<sub>2</sub> as a superhigh hydrophilic substance. As noted in the Office Action, Skarpelos teaches that a device is coated with TiO<sub>2</sub> and/or ZrO<sub>2</sub>. That is, Skarpelos teaches that ZrO<sub>2</sub> is a substitute for TiO<sub>2</sub> as a coating. Since ZrO<sub>2</sub> does not exhibit superhigh hydrophilic properties, it is unlikely that the TiO<sub>2</sub> as a coating in Skarpelos exhibits such properties. If Skarpelos meant to use TiO<sub>2</sub> as a superhigh hydrophilic substance, he would not have taught use of a non-superhigh hydrophilic substance such as ZrO<sub>2</sub> as an alternative.**

\* \* \* \* \*

As noted above, a reference is only anticipatory if it explicitly or inherently, describes each element of a claimed invention. Recognizing the lack of an explicit teaching regarding TiO<sub>2</sub> as a superhigh hydrophilic substance, the Office Action relies on an inherency argument to address the lack of explicit teachings in Skarpelos: "Skarpelos discloses a structure *inherently* capable of meeting applicant's claimed inventive concept." In response, Applicants respectfully rely on MPEP § 2112, which states that while "a rejection under 35 U.S.C. §102/103 can be made when the prior art product seems to be identical except that the prior art is silent to an inherent characteristic," the "[E]xaminer *must* provide rationale or evidence tending to show inherency." (MPEP § 2112, subsections 3 and 4, emphasis added.) It is respectfully submitted that sufficient evidence tending to show inherency has not been provided in the present Office Action. In arriving at this conclusion, Applicants provide the following excerpt from MPEP § 2112:

The fact that a certain result or characteristic may occur or be present in the prior art is not sufficient to establish the inherency of that result or characteristic. *In re Rijkaert*, 9 F.3d 1531, 1534, 28 USPQ2d 1955, 1957 (Fed. Cir. 1993) (reversed

rejection because inherency was based on what would result due to optimization of conditions, not what was necessarily present in the prior art); *In re Oelrich*, 666 F.2d 578, 581-82, 212 USPQ 323, 326 (CCPA 1981). “To establish inherency, the extrinsic evidence ‘must make clear that the missing descriptive matter is necessarily present in the thing described in the reference, and that it would be so recognized by persons of ordinary skill. Inherency, however, may not be established by probabilities or possibilities. The mere fact that a certain thing may result from a given set of circumstances is not sufficient.’” *In re Robertson*, 169 F.3d 743, 745, 49 USPQ2d 1949, 1950-51 (Fed. Cir. 1999) (citations omitted) (The claims were drawn to a disposable diaper having three fastening elements. The reference disclosed two fastening elements that could perform the same function as the three fastening elements in the claims. The court construed the claims to require three separate elements and held that the reference did not disclose a separate third fastening element, either expressly or inherently.)

(Emphasis added.) Inherency means that *the missing descriptive matter is necessarily present* in the reference. The courts have allowed the PTO to rely on inherency arguments to free the PTO from the necessity of finding references which explicitly state that inherent elements are present. This is because certain characteristics are inherent, the references will most probably not mention these elements, and, as such, will be difficult to find. For example, it is not necessary to find a reference that explicitly states that plutonium 239 is radioactive, as plutonium 239 is always radioactive. That is, radioactivity is an inherent feature of plutonium 239.

In the present case, sufficient evidence has not been provided to support an inherency rejection. Applicants’ specification, as explained above, cannot be used as evidence to substantiate an argument that  $TiO_2$  *always* exhibits superhigh hydrophilic properties. Just the opposite is true: there are instances where  $TiO_2$  *does not* exhibit superhigh hydrophilic properties. The subject matter of the rejected claims is thus not *necessarily present* in Skarpelos. It is entirely probable, indeed, almost certain, that Skarpelos will be practiced with  $TiO_2$  not being a superhigh hydrophilic substance, especially in view of the fact that Skarpelos teaches that  $ZrO_2$  is a substitute for  $TiO_2$ , since  $ZrO_2$  does not exhibit superhigh hydrophilic properties. Just as was the case of the third fastener in the example provided in the MPEP quoted above, the subject matter of Applicants’ claims is not expressly or

inherently disclosed in Skarpelos. Thus, a reference that explicitly teaches these limitations must be found, or the claims must be allowed.

\* \* \* \* \*

The Office Action appears to proffer a series of cases in support of a position taken regarding “limitations which are considered to be inherent in a reference,” but does not apply the facts of any case to those at issue or otherwise address why any of those cases are applicable to the facts of the present application. Applicants note that *In re Luditke*, *In re Swinehart* and *In re Brown* do not address or influence a single point made above, and are not cited in the MPEP as doing so. Moreover, these cases were decided in the early 1970’s, and thus are necessarily overruled by the cases cited above in the event of conflict between the cases.

In regard to the citation of *In re Fitzgerald*: *In re Fitzgerald* is discussed at MPEP § 2112, subsection 4, which is entitled “Once A Reference Teaching Product [sic] Appearing to be Substantially Identical is Made the Basis of a Rejection, *and the Examiner Presents Evidence or Reasoning Tending to Show Inherency*, the Burden Shifts to the Applicant to Show an Unobvious Difference.” (Emphasis added.) However, before subsection 4 of § 2112 can be evoked, the requirements of subsection 3 must first be met. It is respectfully submitted that the burden of proof has not yet shifted to the Applicants, because the PTO has not presented sufficient evidence or reasoning tending to show inherency, as is required at MPEP § 2112, subsection 3.

Applicants repeat the first sentence of MPEP § 2112, subsection 3, which is:

“the fact that a certain result or characteristic may occur or be present in the prior art is not sufficient to establish the inherency of that result or characteristic,”

and refer the Examiner to the above discussion on inherency, incorporating those statements herein by reference.

Reliance on *In re Best*, discussed in MPEP §2112.01, is also not applicable with respect to the present claim set. This is because MPEP §2112.01 is directed towards situations where the reference is “identical or substantially identical” to that claimed, except that the reference is silent in regard to certain claimed *properties or functions*, as the first

paragraph of that section indicates. (“Product and apparatus claims – when the structure recited in the reference is substantially identical to that of the claims, claimed *properties or functions* are presumed to be inherent.” MPEP §2112.01, first paragraph.) Again, as noted both above and below, Skarpelos is not “identical or substantially identical” to the claimed invention. *In re Best* does not apply.

\* \* \* \* \*

The Office Action asserts that the use of “adapted to” does not require an examiner to consider the associated claim elements for patentability. This is contrary to the requirements of MPEP § 2173.05(g), which state that a “functional limitation must be evaluated and considered, just like any other limitation of the claim, for what it fairly conveys to a person of ordinary skill in the pertinent art” and that “the Court held that limitations such as ‘members **adapted to** be positioned’ and ‘portions . . . being resiliently dilatable whereby said housing may be slidably positioned’ serve to precisely define present structural attributes of interrelated component parts of the claimed assembly. *In re Venezia*, 530 F.2d 956, 189 USPQ 149 (CCPA 1976).” (Emphasis added.) **Later boards have cited Venezia.**

*In re Pearson*, *In re Yanush*, *In re Finsterwalder*, *In re Casey*, *In re Otto*, and *Ex parte Masham*, are cited in the Office Action in support of the position taken with regard to “adapted to.” The first three cases are not cited by the MPEP, and thus the PTO does not consider these cases to be of sufficient precedent to impact patent application examination. This is not surprising, for even if they stood for the position taken in the Office Action, these cases were all decided before 1976, and thus *In re Venezia*, which is cited in the MPEP for the position taken by Applicants, necessarily overrules the first three cases. The last three cases are cited in the MPEP, but do not opine on the issue at hand (whether to give patentable weight to claim elements associated with “adapted to” or similar language.) Moreover, *In re Casey* and *In re Otto* were both decided before 1976, and thus *In re Venezia* necessarily overrules these cases. *Ex parte Masham*, decided after 1976, is a Board of Patent Appeals and Interferences case, and thus cannot contradict the holding of a United States federal appellate court (who decided *Venezia*).

In sum, the claim elements associated with “adapted to” must be given patentable weight for examination purposes, per MPEP § 2173.05(g). Therefore, the language following

the phrase “adapted to” does indeed serve to impart a structural recitation onto the claims that must be present in a single prior art reference to anticipate the independent claims. Skarpelos does not teach this element, and therefore cannot anticipate the independent claims, as will now be shown.

\* \* \* \* \*

In view of the above, Applicants note that Claim 1 recites that a surface of the separating and removing apparatus “is adapted to *trap thereon* radioactive corrosion products contained in water drops so that radioactive corrosion products firmly adhere to the surface.” (Emphasis added.) Applicants respectfully assert that “adapted to *trap thereon* radioactive corrosion products contained in a plurality of water drops so that radioactive corrosion products firmly adhere to the surface” should be given patentable weight as a structural limitation because the claim presents structural attributes of the present invention.

The invention covered by claim 1 traps/holds the radioactive corrosion products. In an exemplary scenario utilizing the invention of claim 1, steam in a reactor is directed through a separating and removing apparatus, and water drops containing radioactive corrosion products fall on corrugated plates according to the present invention and stick to the plates. When these drops dry, the radioactive corrosion products adhere in films to the surfaces of the corrugated plates, thus remaining on the plates.

In contrast, Skarpelos teaches oxidizing catalysts providing a means for oxidation of ammonia to nitrates or nitrites. “Nitrogen . . . in more volatile forms such as ammonia, are oxidized to non-volatile, water soluble forms comprising nitrates (NO-3) and/or nitrites (NO-2) by catalytic oxidation.” (Skarpelos, col. 4, lines 50-55.) That is, in Skarpelos, the corrosion products are merely converted to a non-volatile substance. Skarpelos does not disclose, teach, or suggest that radioactive corrosion products are trapped anywhere. Instead, in Skarpelos, some corrosion products are merely converted to a non-volatile compound. Thus, the corrosion products are not trapped on a surface: the corrosion products cannot be trapped anywhere, because they are converted to a non-volatile product.

Simply because Skarpelos discloses a component coated with TiO<sub>2</sub> does not mean that the component traps radioactive corrosion products contained in water drops so that the corrosion products adhere to the surface. Even assuming *arguedo* that TiO<sub>2</sub> by itself may exhibit superhigh hydrophilic properties, there is no indication that the Skarpelos components

inherently trap radioactive corrosion products. A “claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference.” (MPEP § 2131, “Anticipation – Application of 35 U.S.C. 102(a), (b), and (e)”). Since Skarpelos does not expressly teach each element of claim 1, and no evidence has been proffered that the components of Skarpelos inherently trap radioactive corrosion products as claimed, the Office Action has failed to make out a proper case for anticipation of claim 1.

\* \* \* \* \*

Claim 4 recites a radioactive separating and removing apparatus employing a metal or a metal oxide as an ion-exchange material that exchanges ions for radioactive ions. Claim 4 also utilizes the phrase “adapted to” to recite a structural element.

As discussed above regarding claim 1, the Skarpelos reference merely converts corrosion products into non-volatile compounds in a chemical reaction. Skarpelos is completely silent in teaching an ion-exchange material that exchanges ions for radioactive ions. Thus, claim 4 is allowable.

Claim 26 is allowable for the pertinent reasons that make claims 1 and 4 allowable.

Further, the claims that depend from claims 1, 4 and 26 are allowable at least due to their dependency from allowable claims.

#### Claim Rejections Under 35 U.S.C. §103(a)

In the Office Action, claims 1-5 and 24-27 are rejected under 35 U.S.C. §103(a) as being unpatentable over Skarpelos in view of admitted prior art or Zeng (JP 11-285635, US equivalent USP 6,217,999) and Hayakawa et al (W0 96/29375). Applicants respectfully traverse the rejection as to the claims above, and submit that these claims are allowable for at least the following reasons.

Applicants rely on MPEP § 2143, which states that:

[t]o establish a *prima facie* case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference

or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations.

It is respectfully submitted that at least the first and third criteria of MPEP § 2143 have not been met in the Office Action.

The Cited References Do Not Suggest All Claim Recitations

Even if the first requirement of MPEP § 2143 was satisfied in the Office Action (which it is not, as explained below), the cited references still do not meet the third requirement, which is that “the prior art reference (or references when combined) must teach or suggest all the claim limitations.”

In formulating the obviousness rejection, Skarpelos is relied on to teach the recitations of independent claims 1, 4 and 26. As seen above, Skarpelos does not teach each and every recitation of these claims, since it fails to teach a surface adapted to trap radioactive corrosion products so that the radioactive corrosion products firmly adhere on the surface of the dryer of Skarpelos, in order to separate and remove the products from the water drops. In regards to claim 4, Skarpelos fails to teach a radioactive material separating and removing apparatus employing a metal or metal oxide as an ion-exchange material adapted to exchange ions for radioactive ions. In regards to claim 26, Skarpelos, does not disclose or suggest a reactor having corrugated plates including an ion-exchange material adapted to exchange ions for radioactive ions.

As already explained, in Skarpelos, the corrosion products are merely converted to a non-volatile substance. Skarpelos does not disclose or suggest that radioactive corrosion products are trapped anywhere or that Skarpelos exchanges ions for radioactive ions. Instead, in Skarpelos, the corrosion products are merely converted to a non-volatile compound. Thus, the corrosion products are not trapped, nor are ions exchanged for radioactive ions.

The Office Action asserts that “Skarpelos discloses applicant’s *inventive concept*,” with the possible exception of teaching a superhigh hydrophilic substance. (Office Action,

page 8, second paragraph, emphasis added.) This is not the case. As seen above, Skarpelos fails to teach or suggest either trapping radioactive corrosion products or exchanging ions with radioactive ions. Thus, the “inventive concept” is not disclosed in Skarpelos, and, therefore, even though the prior art may have taught that utilizing TiO<sub>2</sub> in combination with a binder results in a superhigh hydrophilic material, no evidence has been proffered that by simply adding a binder to Skarpelos, Skarpelos can be transformed from a device that converts volatile compounds to a device for trapping radioactive material. Thus, even after the proffered modification, each and every element of the rejected claims are still not present..

In sum, even if the first requirement of MPEP § 2143 is satisfied, the third requirement of MPEP § 2143 is not satisfied in the Office Action, since the cited references do not teach each and every element of the present invention. Thus, the present claims are allowable.

Lack of Suggestion or Motivation to Modify or Combine the References

MPEP § 2143.01 states that “the prior art *must* suggest the desirability of the invention.” (MPEP § 2143.01, subsection 1, emphasis added.) The Office Action relies solely on the Applicants’ disclosure for motivation to modify Skarpelos to arrive at the invention of claims 1 and 4. The Office Action cites nothing in the prior art that provides motivation to modify Skarpelos to arrive at Applicants’ invention. There is nothing in the prior art that suggests the desirability of Applicants’ invention, and the Office Action does not provide evidence that motivation to modify Skarpelos is in the knowledge generally available to one of ordinary skill in the art.

The Office Action does not identify a reason why Skarpelos would be combined with Zhang to teach the elements of Applicants’ invention. The Office Action simply relies on an argument that

modification of Skarpelos to have included the known Superhydrophilic substance teachings (i.e., incorporation of a binder material) would have been obvious to one having ordinary skill in the art at the time the invention was made as such results are in no more than the use of conventionally known materials/designs available within the art as is evident by the admission by applicant or the teachings of Zeng and Hawakawa.

(Office Action, page 8, 4<sup>th</sup> paragraph.) That is, it would have been obvious to modify Skarpelos because such modification relies only on materials already known in the art. First, the mere fact that all of the elements of an invention may be known distinct from one another in the art does not provide motivation to combine the art. Indeed, if such was the case, the first requirement of MPEP § 2143.01 would be completely eviscerated. Second, this is circular reasoning at best, but is more like impermissible hind sight on the part of the PTO. Applicants provide a rationale for trapping or exchanging radioactive material. It appears that the office action is utilizing the Applicants' own disclosure against them for motivation to modify the prior art.

\* \* \* \* \*

MPEP § 2143.01, subsection 6 states that “the proposed modification cannot change the principle of operation of a reference – If the proposed modification or combination of the prior art would change the principle of operation of the prior art invention being modified, then the teachings of the references are not sufficient to render the claims *prima facie* obvious. *In re Ratti*, 270 F.2d 810 (CCPA 1959).” In *Ratti*, the CCPA held that the “suggested combination of references would require a substantial reconstruction and redesign of the elements shown in the primary reference.” This substantial redesign would have resulted in changing a rigid seal to a resilient seal. Thus, a reference cannot be modified if the modification changes the principle of operation of the reference.

With the above in mind, it is respectfully submitted that since Skarpelos teaches that volatile substances are converted to non-volatile substances as its principle of operation, the addition of a binder material into Skarpelos (assuming *arguendo* that such was possible and that such modification would result in the claimed inventions) so that Skarpelos trapped or exchanged radioactive material would change the principle of operation of the Skarpelos reactor. Since modifying Skarpelos to utilize a binder changes the principle of operation of Skarpelos, “the teachings of [Skarpelos] are not sufficient to render the claims *prima facie* obvious.”

Claim 9

In the Office Action, dependent claim 9 is rejected under 35 U.S.C. §103(a) as being unpatentable over Skarpelos in view of Cowan II (USP 5,465,278). Applicants respectfully

traverse the rejection of claim 9 for at least the pertinent reasons detailed above, and for the additional reason that Cowan II, being directed towards monitoring an electrochemical potential near a weldment in a pressure vessel, is completely silent in regard to a radioactive separating and removing apparatus employing a metal or a metal oxide as an ion-exchange material that exchanges ions for radioactive ions. Because Cowan II does not remedy the deficiencies of Skarpelos, claim 9 is allowable.

Still further, Claim 9 is also allowable for at least the reason that neither Skarpelos nor Cowan II disclose, teach, or suggest a corrugated plate having a p-type oxide film coating with an ion-exchange material on the p-type oxide film. Claim 9 was identified in the Office Action as being a product-by-process claim, just as it was identified in the prior Office Action. Claim 9 was amended in the prior response to remove the product-by-process language. However, claim 9 is again amended so that all possible product-by-process language has been removed. Applicants respectfully request that the PTO reconsider this claim in view of these amendments.

Skarpelos does teach depositing oxidizing catalysts on a steam separator and/or a dryer unit. However, this is not the same as a component with a layer comprising an ion-changing material and a layer comprising a p-type oxide film. Because Skarpelos is silent in regard to this element, claim 9 is allowable for this additional reason as well.

### New Claims

Applicants have added new claims 28-34. These claims are allowable at least due to the pertinent reasons discussed above. Namely, that Skarpelos, alone or after modification in view of Zhang and/or Cowan II, disclose or suggest neither a reactor having a surface as claimed that has superhigh hydrophilic TiO<sub>2</sub> adapted to trap adapted to trap thereon radioactive corrosion products contained in a plurality of water drops so that the radioactive corrosion products firmly adhere on the surface, in order to separate and remove radioactive corrosion products from plurality of water drops, nor a reactor having a dryer as claimed having a plurality of corrugated plates defining therebetween passages through which a multiphase flow containing the steam, water drops and radioactive substances flows, wherein

the corrugated plates have surfaces having superhigh hydrophilic TiO<sub>2</sub>. Allowance of these claims is respectfully requested.

**Withdrawn Claims**

Applicants respectfully request that claims 6, 7, 10, 11 and 13-14 and 16-18 be considered and allowed because those claims depend, either directly or indirectly, from claim 4, and thus no examination of these claims under 35 U.S.C. §§ 102 and 103 is necessary.

**Conclusion**

Applicants believes that the present application is now in condition for allowance. Favorable reconsideration of the application as amended is respectfully requested.

The Commissioner is hereby authorized to charge any additional fees which may be required regarding this application under 37 C.F.R. §§ 1.16-1.17, or credit any overpayment, to Deposit Account No. 19-0741. Should no proper payment be enclosed herewith, as by a check being in the wrong amount, unsigned, post-dated, otherwise improper or informal or even entirely missing, the Commissioner is authorized to charge the unpaid amount to Deposit Account No. 19-0741. If any extensions of time are needed for timely acceptance of papers submitted herewith, Applicant hereby petitions for such extension under 37 C.F.R. §1.136 and authorizes payment of any such extensions fees to Deposit Account No. 19-0741.

Examiner Keith is invited to contact the undersigned by telephone if it is felt that a telephone interview would advance the prosecution of the present application.

Respectfully submitted,

By 

Date NOV 24, 2009

FOLEY & LARDNER LLP  
Washington Harbour  
3000 K Street, N.W., Suite 500  
Washington, D.C. 20007-5143  
Telephone: (202) 295-4747  
Facsimile: (202) 672-5399

Martin J. Cosenza  
Attorney for Applicant  
Registration No. 48,892